This “generic” quality assurance manual and related Operating Procedures Manuals (OPM), using the fictional ABC Airplane Company as the manufacturer, is intended to be used as an example of a simplified means of compliance with the Federal Aviation Regulations governing manufacturers of small, noncomplex aircraft (i.e., Primary Category, JAR/VLA, and Light-Sport Aircraft)

November 1, 1991

ABC AIRPLANE COMPANY
QUALITY ASSURANCE MANUAL

November 1, 1991

PREFACE

This “generic” quality assurance manual and related Operating Procedures Manuals (OPM), using the fictional ABC Airplane Company as the manufacturer, is intended to be used by a relatively small company with limited resources as an example of a simplified means of compliance with the Federal Aviation Regulations governing applicants for, and holders of FAA Production Certificates.

The organization chart for the “ABC Airplane Company” does not show the typical “boxes” for all of the sub-departments, since a small manufacturer would most likely need to cross-utilize personnel to achieve the most economical operation. The user of this manual may arrange the sub-organization functions in departments that best suit his needs, with one person's name appearing in more than one of the boxes.

The intent of the organization chart showing Receiving Inspection and Production Inspection reporting to the Director of Manufacturing instead of the Director of Quality Assurance (which may be considered “traditional”) is to have one company focal point instead of two, with the responsibility to establish the requirements for staffing (including inspectors), facilities, equipment, scheduling, and cross-utilization in order to most effectively meet the company budgetary and production goals. The Director of Quality Assurance still has the major responsibility of controlling the issuance of inspection stamps and inspection credentials only to persons the Director has found experienced and properly qualified, and to closely monitor the inspectors performance. The Director of Quality Assurance is also responsible for auditing all production functions and facilities to ensure compliance with established procedures and to ensure that corrective action is taken promptly when discrepancies are found.

The control and tracking systems described in the Operating Procedures Manuals are purposely very fundamental (card indexes, for example) and they serve the purpose, but a manufacturer having computer capability may find it more convenient to use computer generated systems that meet the same goals.

The Engineering OPM describes a system for documenting minor changes with “Advanced Change Notices “ (ACN), up to 5 before the basic drawing is updated. This ACN system would benefit a small manufacturer by keeping the cost of changing and printing complete drawings to a minimum, while still providing a means to document, identify, and control minor changes to the type design.

The OPMs describe a system whereby the FAA or a Designated Manufacturers Inspection Representative, working with Planning, establish certain requirements for special FAA inspections at selected points in the production process. It should be noted that this function is based on the airworthiness certification provisions of FAR 21.183(a) and is not intended as a form of production inspection.

FORWARD

This Quality Assurance Manual and the Operating Procedures Manuals referenced herein describe the quality assurance requirements for the ABC Airplane Company, 1350 Willow Road, Wichita, Kansas, holder of Federal Aviation Administration Production Certificate Number XXXXXX, as required by Federal Aviation Regulations 21.139 and 21.143. Changes to this manual and/or changes to the quality assurance system are made available for review by the local Manufacturing Inspection District Office (MIDO). The ABC Airplane Company will immediately notify the MIDO in writing of any change that may affect the inspection, conformity, or airworthiness of ABC airplanes. The ABC Airplane Company does not at this time hold a Manufacturers Maintenance Facility approval.

The ABC Airplane Company incumbent Director of Quality Assurance is responsible for implementing the provisions of this manual.

APPROVED BY:

ABC Airplane Company:

_____
Director of Quality Assurance

_____
Date

November 1, 1991

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REVISION CONTROL

Revision Number	Change	FAA Approved (signature)	Date

QUALITY ASSURANCE MANUAL

ABC AIRPLANE COMPANY
1350 Willow Road
Wichita, Kansas 12345-1234

Production Certificate No. XXXXXX
Displayed in the Office of the President

COMPANY QUALITY ASSURANCE POLICY

The ABC Airplane Company is dedicated to maintaining a quality assurance system that will assure conformity of each airplane at all stages of fabrication and assembly to the FAA approved type design data.

ORGANIZATION

The organization (less administration and accounting) consists of three departments, ENGINEERING, MANUFACTURING, and QUALITY ASSURANCE. Each department is further subdivided as necessary to achieve the most efficient use of manpower as needed to maintain the established production rate for completed airplanes. The chart on page 5 shows the major departments and the functions for which each is responsible.

DEPARTMENT RESPONSIBILITIES

QUALITY ASSURANCE

The Director of Quality Assurance is responsible to the company president for assuring that the production of airplanes is in conformity with the data and procedures FAA approved for the Production Certificate. Quality Assurance findings concerning non-conforming parts or procedures that may be questioned by other organizational components must be resolved through proper materials review actions and, if necessary, with coordination by the company president.

The Director may delegate inspection functions, but not responsibilities, to personnel of other departments with the concurrence of the other department heads and the company president.

The Quality Assurance Department is responsible for maintaining the Quality Assurance Manual and for notifying the FAA of any changes in the quality assurance system that may affect the inspection, conformity, or airworthiness of ABC airplanes.

The Director of Quality Assurance is also responsible for ensuring that statistical sampling plans that may be used by the ABC Company conform to industry standards, are monitored and controlled to guard against invalid sampling, and have been found acceptable to the FAA.

MANUFACTURING

The Director of Manufacturing is responsible for all phases of the production process, from procurement of raw material to flight test of each completed airplane, making the most efficient use of manpower to maintain the established production rate.

The Director works in close coordination with the Director of Quality Assurance in performing those functions that require inspection duties. Inspection personnel may report administratively to the Director of Manufacturing when such reporting results in more efficient use of company personnel, however, the responsibility for oversight of all inspection functions remains with the Director of Quality Assurance.

ENGINEERING

The Director of Engineering is responsible for the development of all engineering drawings, process specifications, test procedures, and other data that form the basis for the FAA approved type design, including changes to such drawings and data that require FAA engineering approval.

The Director is also responsible for establishing a data change control and issuance system to ensure that only current data are used by production and inspection personnel.

The Director works in close coordination with the Directors of Manufacturing and Quality Assurance and with FAA engineering, in resolving Service Difficulties and, as necessary, generating Service Bulletins or Airworthiness Directives. Included in this function is reporting, processing and resolving failures, malfunctions, and defects that are within the scope of FAR 21.3.

PROCEDURES AND FORMS

The ABC Airplane Company operating procedures are contained in Operating Procedures Manuals (OPM) that by reference become a part of this Quality Assurance Manual. All changes to the OPM are subject to review by the FAA in a manner developed by the Director of Quality Assurance and the local FAA Manufacturing Inspection District Office.

Detailed step-by-step instructions to supplement an OPM procedure, if such instructions would be helpful or necessary in carrying out an OPM requirement, may be issued by individual departments in Operating Instruction (OI). Each such OI must be identified with the OPM number and with the OPM paragraph upon which the OI is based, and must be signed by the Director of the department involved. The first OI to be issued for a function, would be titled, for example, “OPERATING INSTRUCTION. Storage and Issuance 1.3.6. OPM 1-1”.

The following OPM contain the basic instructions, and examples of the forms used for all the functions related to the production process.

OPM-1 MANUFACTURING

Purchasing
Receiving Inspection
Storage and Issuance
Production Control
Manufacturing Planning
Work Instructions
Nonconformances and Materials Review
Production Inspection
Inspection Records
Production Ground Tests
Production Flight Tests
Measure and Test Equipment Control
Forms

OPM-2 ENGINEERING

Responsibilities
Classifying Changes to the Type Design
Data Change Control
Materials Review
Production Ground Test
Production Flight Test
Process Specifications
Materials Specifications
Supplier Qualifications
Service Difficulties
FAR 21.3 Reporting
Forms

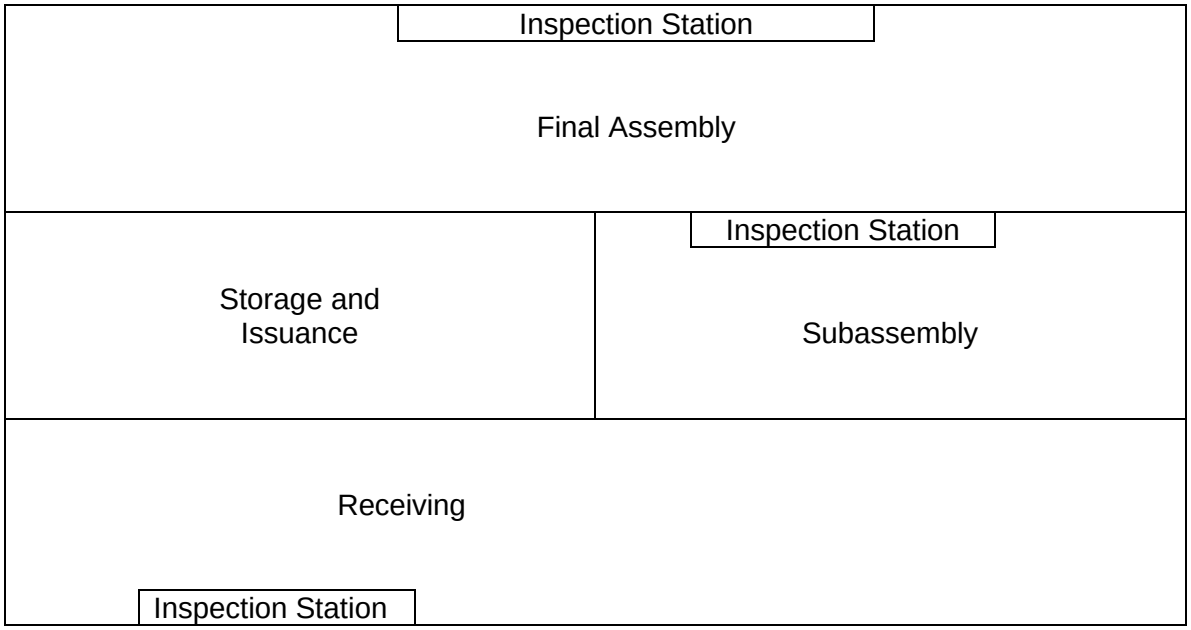
OPM-3 QUALITY ASSURANCE

Production Inspection
Inspection Stations
Inspection Records
Materials Review
Quality Assurance Audits
Audit Follow-up Action
FAA ACSEP Audits

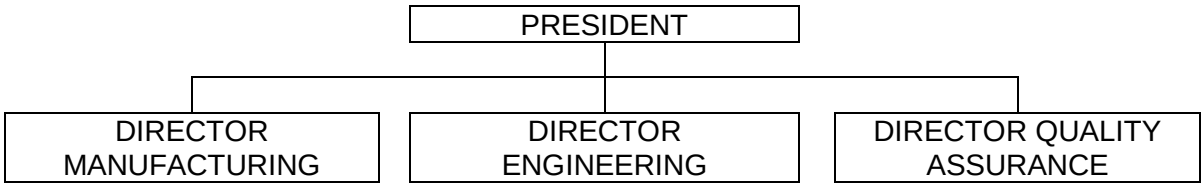
DIAGRAM - FACILITY AND INSPECTION STATIONS

The Directors of Manufacturing, Engineering, and Quality Assurance are responsible for establishing and maintaining Inspection Stations at locations easily accessible to production and inspection personnel. The Quality Assurance Department is responsible for ensuring that each station has all of the documents and data required for the applicable phase(s) of production, and that all such documents and data incorporate the most current FAA approved changes.

FACILITY DIAGRAM SHOWING INSPECTION STATION LOCATIONS



ORGANIZATION CHART AND FUNCTIONAL RESPONSIBILITIES



DIRECTOR MANUFACTURING	DIRECTOR ENGINEERING	DIRECTOR QUALITY ASSURANCE
FUNCTIONS	FUNCTIONS	FUNCTIONS
Work Instructions	Work Instructions	Work Instructions
Purchasing	Test Procedures	Quality Manual
Production Inspection	Materials Review	Inspection Records
Measure & Test Equipment	Process Specifications	QA System Changes
Manufacturing Planning	Materials Specifications	QA Audits
Production Control	Service Difficulties	Supplier Control
Receiving Inspection	FAR 21.3 Reporting	Airworthiness Certification
Storage & Issuance	Data Change Control	Materials Review
Nonconformances & Materials Review	Production Flight Test	Statistical Sampling
Production Flight Test	Production Ground Test	Inspector Qualification
Production Ground Test	Supplier Qualification	Inspection Stamp Control
Inspection Records	Forms	Production Inspection
Inspection Stations		Inspection Stations
Forms		Forms

ABC AIRPLANE COMPANY
OPERATING PROCEDURES MANUAL
MANUFACTURING
OPM-1

November 1, 1991

OPERATING PROCEDURES MANUAL
MANUFACTURING OPM-1

ABC AIRPLANE COMPANY
1350 Willow Road
Wichita, Kansas 12345-1234

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REVISION CONTROL

Revision Number	Change	FAA Approved (signature)	Date

SECTION 1

1.1 PURCHASING. The Director of Manufacturing and, as required, the Director of Quality Assurance, are responsible for assuring that the following procedures are adhered to by ABC personnel assigned to perform the functions.

1.1.1 PURCHASE ORDERS (PO), ABC Form PO-100, are written for all parts and materials purchased for use in production airplanes.

1.1.2 The Purchasing Officer will specify on the PO the materials that are shown on the FAA approved drawings and applicable specifications, including the design and quality requirements. The Purchasing Officer will obtain the approval of the Engineering Department before writing a PO for substitute materials.

1.1.3 The Purchasing Officer will obtain from the Quality Assurance Supplier Control Department a list of suppliers that the department has found qualified to provide parts and materials that consistently conform to the design and quality requirements. PO's will be issued only to those suppliers found qualified, including local suppliers.

1.1.4 The PO includes in the design and quality requirements a provision that the supplier must notify and obtain approval from the ABC Engineering Department for changes in the design made by the supplier.

1.1.5 The Purchasing Officer and Quality Assurance will provide instructions for direct shipment on the PO when a domestic supplier has been found by Quality Assurance to be qualified for making such shipments. (Suppliers located in foreign countries, if such suppliers might be used by the ABC Company, will not be authorized for direct shipment under any circumstances.) Domestic suppliers selected to make direct shipments will be authorized by the Director of Quality Assurance to place the following statement on invoices, as evidence to the purchaser that the part(s) are FAA approved:

> "The part(s) covered by this invoice has (have) been produced under ABC Airplane Company Production Certificate No. XXXXXX and conform(s) to the applicable type design under Type Certificate No. XXXX."

1.1.6 The PO consists of four copies: two for the vendor, one for the "open PO" file, and one for Receiving Inspection.

1.1.7 Purchasing will notify all suppliers to ABC Airplane Company that they are subject to FAA inspection/surveillance.

1.2 RECEIVING INSPECTION. The Director of Manufacturing, and as required, the Director of Quality Assurance are responsible for assuring that all products and services procured from suppliers upon delivery to ABC conform to the type design as specified in the Purchase Order (PO), and that ABC personnel assigned to receiving inspection functions adhere to these procedures.

1.2.1 All incoming shipments will be delivered to the receiving area. The Receiving Inspector will pull the PO called out on the packing slip from the PO files. If the PO requires material certifications or affidavits, the Receiving Inspector will verify that they have been received and will attach them to the PO.

1.2.2 The Receiving Inspector will first check the shipment for condition (shipping damage, etc.), and if damage is found, a Rejection Slip, ABC Form RJ-100, will be issued against the shipment, which will then be routed to the Material Review segregated area, for disposition.

1.2.3 When the shipment is in good condition, the Receiving Inspector will inspect the items for compliance with the PO requirements, and for conformity with the applicable drawings and specifications.

1.2.4 Raw materials will be visually inspected for condition, and must be accompanied by the certifications or affidavits required by the PO. The Receiving Inspector will identify raw material that has been accepted with a stamp or tag before releasing the material to storage or production.

1.2.5 All items processed and inspected by the Receiving Inspector that do not conform to the applicable drawings or specifications will be rejected and routed to the Materials Review segregated area for disposition.

1.2.6 The Receiving Inspector will execute a Receiving Report, ABC Form RE-100, with the following distribution for a shipment that has met all of the PO and inspection requirements: one copy to be attached to the PO; one copy to Production Control; one copy to Storage; and one copy to Accounting.

1.2.7 When a shipment has been rejected for any reason, the Receiving Inspector will send the Receiving Report, all copies, with the shipment to the Materials Review segregated area. The final disposition will be recorded on the report after the Materials Review Board action, and the report will be returned to the Receiving Inspector for distribution in accordance with paragraph 1.2.6.

1.2.8 In the event the Material Review Board rejects a shipment, the shipment will be returned to the supplier.

1.2.9 When the PO has been completely filled, all required certifications or affidavits will be attached and the package will be returned to the Purchasing Office and filed for the record with the original PO.

1.3 STORAGE AND ISSUANCE

1.3.1 The Director of Manufacturing is responsible for providing and maintaining a storage area(s) that will provide for protection against deterioration or damage to products in storage, and that handling devices, environmental control methods, and transportation vehicles are suitable for the products involved and are loaded as required to prevent damage.

1.3.2 The Director of Quality Assurance is responsible for ensuring that when special packaging requirements or storage environments (refrigerators, freezers, etc.) must be maintained, packages are labeled to indicate this condition, with the labeling requirements shown on the Purchase Order, ABC Form PO-100.

1.3.3 Upon receipt of a shipment from Receiving Inspection, the Storage Clerk will ensure that the shipment is accompanied with a copy of the Receiving Report, ABC Form RE-100, indicating satisfactory acceptance. The report will be filed in the storage area by the Storage Clerk.

1.3.4 Items that are labeled with expiration dates (O-rings, seals, etc.) will be stored in properly identified bins. The Storage Clerk will maintain a file index to ensure that the oldest items are issued first, and that items that have expired are routed to the Materials Review segregated area for disposition.

1.3.5 Items that require environmentally controlled storage, (“icebox” rivets, sealant, etc.) will be stored in refrigerators or freezers with appropriate temperature controls and recording thermometers installed to ensure that the temperature requirements are maintained. The Director of Manufacturing is responsible for ensuring that such refrigerators or freezers are provided in either the storage area or near the production line.

1.3.6 The Storage Clerk is responsible for checking the recording thermometers daily to ensure that the temperature has remained within limits. If a discrepancy is found, such as due to a power failure or a faulty refrigerator or freezer, the Storage Clerk will execute a Rejection Slip, ABC Form RJ-100, covering all of the material involved, and route the slip to the Materials Review area for action by the Materials Review Board. The contents of the refrigerator or freezer will not be used in production until corrective action or rejection has been determined by the Board.

1.3.7 The Storage Clerk will check accepted raw materials for proper identification and store such materials either in an appropriately secured storage area or in plainly marked or fenced areas in the factory proper.

1.3.8 When completed or semi-completed detail parts and/or subassemblies are routed to storage pending eventual use in further stages of production, the Storage Clerk will check the item(s) for condition and ensure that a shop traveler, ABC Form ST-100, accompanies the item to indicate its inspection status at the time of routing to storage. The Shop Traveler will remain with the item in storage and be issued with the

item when it is eventually requisitioned by production. The Storage Clerk should notify production inspection if a Shop Traveler is not with the semi-completed detail parts and/or subassemblies.

1.3.9 The Storage Clerk is responsible for:

1.3.9.1 Maintaining all storage areas in a clean and orderly condition.

1.3.9.2 Conducting monthly checks to ensure appropriate disposition of all out-of-date items, reference paragraph 1.3.4.

1.3.9.3 Ensuring that large or unwieldy items are secured and properly protected from damage when placed in transport vehicles and during delivery to work areas.

1.3.9.4 Maintaining storage booths and/or storage bins, for small parts or “standards”, that are located in production shop areas, and ensuring that such booths or bins are adequately stocked to meet production needs by ordering replenishments before the supply is exhausted.

1.3.9.5 Ensuring proper handling of composite material, and separation of composite storage areas from the rest of the manufactured items.

SECTION 2

2.1. PRODUCTION CONTROL

2.1.1 Production control is maintained though issuance by Manufacturing Planning of Shop Travelers, ABC Form ST-100, which list the work items for manufacturing detail parts, and for all subsequent assembly operations.

2.1.2 A space is provided on the Shop Traveler for a completion stamp for each work item by the shop and for an inspection stamp by Production Inspection. The inspectors, when the Shop Traveler with attached drawings and the parts or materials are presented to him, will inspect the item(s) for conformity with the drawings and for condition and workmanship.

2.1.3 When each work item on the Shop Traveler has been found in conformity, the inspector will stamp the form in the appropriate box, together with the date. When all work items on the Shop Traveler have been satisfactorily completed and inspected:

2.1.3.1 For detail parts, the inspector will stamp the part, or each part if the traveler covers a batch of parts, with his inspection stamp to indicate that the part(s) is acceptable for installation in the next assembly. The part(s) will be routed either to the assembly area or to Storage and Issuance. The traveler will be routed to Quality Assurance for filing.

2.1.3.2 For assemblies, the inspector will stamp each completed assembly, next to the part number, with his inspection stamp. The assembly will be routed either to the next assembly operation or to Storage and Issuance. If the assembly is incomplete and requires additional work in another shop covered by the same Shop Traveler, the assembly together with the Shop Traveler will be routed either to the shop or to Storage and Issuance.

2.1.3.3 For final assembly operations, the Shop Traveler will be filed in a master file for each airplane by serial number until the airplane is shop complete and satisfactorily flight tested. The completed file will then be routed to Quality Assurance for filing.

2.1.3.4 Shop Travelers with open items will be processed in accordance with paragraph 2.1.4.

2.1.3.5 When a work item on the Shop Traveler is found not in conformity, the inspector will prepare a Rejection Slip, ABC Form RJ-100, and return the part or material back to the shop for corrective action, which would be either through engineering approved rework or Material Review action. A Shop Traveler for a part or material with a rejected work item will not be released for delivery to the next operation until the rejected item has been cleared and satisfactorily inspected.

2.1.4 When a Shop Traveler has one or more open work items because of parts shortages or other valid reasons, the part or assembly may be released to the next production operation, however, Production Control will post the incomplete Shop Traveler in a prominent place in the appropriate Inspection Station, to ensure that subsequent assembly operations cannot be finally cleared until the open item(s) on a Shop Traveler has been satisfactorily completed. Production Control will continually review Shop Travelers with open work items to ensure that completion of a subsequent work operation will not render the open item uninspectable, such as by enclosing the area in which the open item is to be completed. "Working around" an open item is kept to a minimum and used only in extenuating circumstances to preclude shutting down production, but in all cases, Shop Travelers with open items will follow the airplane through final assembly and flight test if necessary, and must be cleared before an airplane may be delivered.

2.1.5 Satisfactorily completed Shop Travelers, except those covering final assembly operations (reference paragraph 2.1.3.3.) will be routed to Quality Assurance for filing for the record.

2.2 MANUFACTURING PLANNING

2.2.1 Manufacturing Planning is responsible for developing, coordinating, and issuing Shop Travelers, ABC Form ST-100.

2.2.2 In the development process of Shop Travelers, Planning will work in close coordination with the Engineering and Quality Assurance Departments to ensure that:

2.2.2.1 The work items on a Shop Traveler are based on the latest Engineering drawings and specifications. Engineering will provide Planning with copies of all drawing changes as they are made to ensure currency of the Shop Travelers.

2.2.2.2 Revised Shop Travelers are released to Production in a timely manner, and that superseded Shop Travelers are removed from production areas.

2.2.2.3 Shop Travelers are released at appropriate stages of production to ensure that no work items will result in closed areas that may subsequently be in an uninspectable condition.

2.2.2.4 Upon request as part of its responsibility under FAR 21.183(a), the FAA Manufacturing Inspection District Office (MIDO) or, if authorized by the MIDO, the ABC Designated Manufacturing Inspection Representative (DMIR) is given the opportunity to review any or all Shop Travelers as they are developed, with particular emphasis on those where completion of the work items will result in closure of areas that have previously been inspected. At the FAA's discretion, an item requiring FAA inspection may be added to such Shop Travelers, or to any other Shop Traveler that the FAA considers to involve critical areas of the airplane or critical work items or special processes.

2.3 WORK INSTRUCTIONS

2.3.1 The Director of Manufacturing is responsible for ensuring that clear and concise work instructions are provided to all personnel involved in production fabrication and assembly operations.

2.3.2 The development of work instructions may be initiated by any ABC person involved in production operations at any level, reviewed by that person's supervisor, and submitted to the Director of Manufacturing for approval.

2.3.3. Approved work instructions will be:

2.3.3.1 Added to the Manufacturing Operating Procedures Manual if the Engineering and/or the Quality Assurance Departments also may be involved in the particular work function; or

2.3.3.2 Issued as Operating Instructions if the new work instructions concern only details to supplement specific items in an Operation Procedures Manual.

2.3.4 Operating Instructions, even though issued within an ABC Company department, will be subject to FAA review at the discretion of the FAA Manufacturing Inspection District Office.

2.4 NONCONFORMANCES AND MATERIALS REVIEW

2.4.1 The Director of Manufacturing is responsible for providing:

2.4.1.1 An enclosed area(s) with a lockable entry to be used for storing nonconforming items awaiting Materials Review disposition.

2.4.1.2 Bins or containers, marked in red with the word REJECTIONS, in fabrication and subassembly areas where items awaiting material review action or damaged detail parts will be placed until transported to the Materials Review area.

2.4.1.3 Facilities and/or tools as may be required for physical mutilation or destruction of items that are rejected by the Material Review Board. Marking an item with the word REJECTED is acceptable ONLY when the item might still be usable as part of a prototype mockup by the Engineering Department. Items that are determined to be scrap will be placed in a locked container, preferably colored red, until disposition in accordance with paragraph 2.4.2.

2.4.2 The mutilation of rejected items will be by cutting with tools or torch, or smashing with a hammer in such a way that the item cannot possibly be repaired or otherwise refurbished and used on an airplane. The Director of Manufacturing is responsible for ensuring that no rejected item will be sold as scrap by the ABC Company until such mutilation has been carried out.

SECTION 3

3.1 PRODUCTION INSPECTION

3.1.1 The Director of Manufacturing is responsible for providing qualified and experienced personnel to perform inspections of parts, assemblies, and final assembly work functions. The Director of Quality Assurance is responsible for reviewing the qualifications of such personnel, and for auditing their performance.

3.1.2 The Quality Assurance Department is responsible for issuing each production inspector found qualified an inspection stamp that imprints a serial number assigned by the Quality Assurance Department. Each authorized inspector will have a different number, the assignment of which will be appropriately controlled by the Quality Assurance Department. If the Manufacturing and Quality Assurance Departments concur that the performance of an inspector is unsatisfactory, the inspection stamp will be withdrawn.

3.1.3 Manufacturing personnel assigned and approved as production inspectors are responsible for maintaining an unbiased attitude in performing their inspection duties. The Director of Manufacturing is responsible for ensuring that an inspectors decision is not influenced by production schedules or other pressures. The inspectors decisions and findings will be binding, and if questioned will be resolved by appropriate Materials Review Board action.

3.1.4 The Shop Travelers provide the primary work instruction and reporting for the production inspector, however, if a production inspector observes any unsatisfactory condition not necessarily covered by Shop Traveler work items, he is held responsible for reporting such a finding by execution of a Rejection Slip, ABC Form RJ-100.

3.1.5 The inspector will review all open Shop Travelers before the release of any item for further assembly operations, to ensure that an incomplete task will not result in an unworkable or uninspectable condition if the incomplete item is installed in the next assembly.

3.1.6 In no case will the inspector release an airplane for flight if open items on Shop Travelers could cause unairworthy conditions. In addition, no airplane will be considered airworthy until all open item Shop Travelers have been satisfactorily resolved, with the Shop Traveler appropriately stamped by the inspector.

3.2 INSPECTION RECORDS

3.2.1 The primary record for documenting work performance, inspection, and testing is the Shop Traveler, ABC Form ST-100. This form when completed indicates the acceptability of work or products and, together with completed Rejection Slips, ABC Form RJ-100, documents the action taken in connection with noncompliance.

3.2.2 The Director of Manufacturing is responsible for ensuring that all personnel who are required to use the Shop Travelers are made aware through appropriate training how to use the form, its importance to producing a high quality airplane, and that the entries must always be complete and reliable.

3.2.3 The Shop Traveler also provides a record of the currentness of drawings and changes in design, through timely revisions by Manufacturing Planning.

3.2.4 The ABC custodian for completed Shop Travelers is the Director of Quality Assurance, who will provide facilities for storage of the records for at least two years after the airplane to which they apply have been delivered.

SECTION 4

4.1 PRODUCTION GROUND TESTS

4.1.1 The Director of Engineering is responsible for developing the parameters for all production ground functional tests of airplane systems, and for final rigging checks of flight surfaces and controls. These parameters, including the design required angles, travels, etc., will be entered on the Shop Traveler covering the system by Planning, for use and sign-off by the shop and by the inspector witnessing the tests. The satisfactorily completed Shop Travelers will be routed to Quality Assurance for filing with the other inspection records for the airplane.

4.1.2 The Director of Manufacturing is responsible for providing the personnel and facilities as required to ensure that the ground tests are properly completed.

4.2 PRODUCTION FLIGHT TESTS

4.2.1 The Director of Engineering is responsible for developing production flight test procedures and a checkoff list, including appropriate space for recording unusual difficulties or questionable conditions, to document the results of each production flight test. The procedures and list will be submitted by Engineering to the FAA Aircraft Certification Office for review and approval.

4.2.2 The Director of Manufacturing is responsible for providing a properly qualified pilot to perform the production flight tests, and an observer to call out the items on the checkoff list and to record the results of each test item.

4.2.3 The Shop Traveler will supplement the flight test procedures and checkoff list, with appropriate space provided to record unsatisfactory conditions. Any such conditions must be satisfactorily resolved and signed off by the shop and production inspection. The completed Shop Traveler with the completed flight test checkoff list will be routed to Quality Assurance for filing with the records for the airplane.

SECTION 5

5.0 MEASURE AND TEST EQUIPMENT CONTROL

5.1 The Director of Manufacturing and the Director of Quality Assurance are jointly responsible for providing and maintaining gages and other measuring and testing devices necessary to ensure that all detail parts, assemblies, processes, and tests conform to the applicable drawings and specifications.

5.2 The Director of Quality Assurance is responsible for ensuring that calibration of measuring and testing devices is performed by agencies or laboratories that use certified measurement standards, traceable to the National Institute of Standards and Technology.

5.3 The Director of Manufacturing is responsible for:

5.3.1 Procuring the measuring and test devices and for providing environmentally controlled areas for their storage or use, to the extent necessary to ensure that materials, parts, assemblies, and major components inspected with these devices meet the standards called out in the airplane approved type design.

5.3.2 Establishing and monitoring the system for controlling the issuance and recall of measuring and test equipment. This system, maintained by personnel assigned by the Director of Manufacturing for storing and issuing tools, consists of:

5.3.2.1 Index cards recording the nomenclature and serial number of each device, the date it was procured, the date it was last calibrated, the date it was issued to the shop, the date it will be due for its next calibration, and the date a recall notice is due to be issued to the shop.

5.3.2.2 The index cards will be reviewed weekly to determine which devices are due for recall, and notices will be sent to the shop to which the devices were checked out.

5.3.2.3 Following calibration, at the time the device is again checked out for use, a sticker will be affixed showing the date the device is again due for calibration. The time period between calibrations for each device is determined by Quality Assurance, who will issue an appropriate listing for posting in the tool and gage control area.

5.4 The measure and test equipment control requirements also apply to:

5.4.1 Any production tooling that, when used, establishes the conformity to the drawings or specifications of the part or assembly made with the tool. Such tooling will have serial numbers assigned and will have identification plates or tags affixed showing the tool’s inspection status.

5.4.2 Recording thermometers or other control devices used for maintaining required storage environments.

5.4.3 Gages and controls used for monitoring critical times and temperatures required by processes.

5.4.4 Weighing and liquid measuring equipment whenever the accuracy of such equipment is critical to ensuring conformity of the end item to the drawings or specifications.

SECTION 6

6.0 FORMS. This section shows examples of forms used by the ABC Airplane Company in the production process.

ABC Form PO-100
Page ___ of ____

PURCHASE ORDER

ABC AIRPLANE COMPANY
1350 Willow Road
Wichita, Kansas 12345-1234

TO:

Purchase Order No.: _____
Date: _____
Terms: _____
Ship Via: _____

SHIP TO:

PLEASE ACKNOWLEDGE PROMPTLY AND INVOICE IN DUPLICATE

ITEM	QTY	CODE NO.	PART NO.	DESCRIPTION	UNIT PRICE	UNIT	AMOUNT

SUBJECT TO CONDITIONS ON REVERSE SIDE

PACKING SLIPS MUST ACCOMPANY ALL SHIPMENTS

SHIPPING SCHEDULE DESIRED:

_____

_____

_____

_____
PURCHASING AGENT

(PURCHASE ORDER REVERSE SIDE)

AGREEMENTS AND CONDITIONS

1. Acknowledgment - This order shall not be effective nor shall Buyer be obligated to pay any monies called for hereunder unless and until Seller shall have signed and returned written acknowledgment and acceptance.

2. Seller's Conditions - No conditions laid down by Seller in accepting or acknowledging this order shall be binding upon Buyer if in conflict with any instructions, agreement and/or condition herein stated, unless expressly accepted by Buyer in writing.

3. Invoices - Seller must mail invoices for each shipment to Buyer on date of shipment.

4. Shipping Instructions - Seller shall make no charges for boxing, crating, or carting unless previously agreed to in writing by Buyer. Seller shall comply with the shipping instructions specified on the reverse side hereof.
   All articles shall be suitably packed or otherwise prepared for shipment to prevent damage in transit and to meet carrier's requirements. All articles shall also be suitably packed and classified to assure lowest transportation and insurance rates consistent with full protection against loss or damage.

5. Cash Discount - The cash discount period will date from the receipt in Buyer's main office of Seller's invoice accompanied by waybill, and not from date of Seller's invoice. Buyer may pay Seller's invoice before delivery and complete inspection or test of the article and thereby avail itself of the cash discount. By such payments, Buyer does not waive its right to reject the articles and may charge the account of Seller for any loss, shortage, defect or failure in performance, delay, or other default.

6. Cancellation - If the Seller refuses or fails to make deliveries of the articles within the time specified in this order or any extension thereof, Buyer may terminate the right of Seller to deliver the articles, except when delay of Seller in delivering articles is due to unforseeable causes beyond the control and without the fault or negligence of Seller, including but not restricted to, acts of God or of the Public Enemy, acts of Government, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, but not including delays caused by subcontractors or suppliers; provided that Seller shall, within ten (10) day from the beginning of such delay, notify Buyer in writing of the cause of delay; and provided further that if delay due to such unforseeable causes exceeds a total period of sixty (60) days, Buyer may terminate the right of Seller to deliver the articles.
   In the event of any suspension of payment, or the institution of proceedings by or against either party, voluntary or involuntary, in bankruptcy, or insolvency, or under provisions of the United States Bankruptcy Act, or for the appointment of a receiver or trustee or an assignee for the benefit of creditors, of the property of either party, the other shall be entitled to cancel this contract forthwith by written notice.
   If any of the articles ordered herein purports to be protected by one or more patents, and a decree of judgment be entered in a court of competent jurisdiction holding invalid any such patents or any of the protection which it purports to give, this contract may forthwith be canceled by the Buyer.

7. Specifications - Except as otherwise stated, all material or equipment for aircraft construction listed herein, to which Government or Buyer's specifications are applicable, must comply with such specifications current as of date of this order. Should such specifications be revised prior to shipment, Seller, by first obtaining consent of Buyer, may furnish such material or equipment in accordance with revised specifications.
   Where a specification number is noted for supplies ordered, Seller must supply in triplicate a notarized report confirming manufacture of materials to the specification. This report must bear Buyer's purchase order number and description of materials shipped. This report must be mailed at time of shipment direct to Buyer, one copy of same to accompany shipment.

8. Patent Protection - By accepting this order, the Seller agrees to indemnify and hold harmless and protect the Buyer, its successors, assigns, customers, and the users of its products from and against all loss, liability, claims, demands, and suits of law or equity for actual or alleged infringement of any patent or patents by the normal use or sale of such material or goods. No patent application is to be made by Seller in connection with design development during the manufacture of items of Buyer's original design unless prior written approval is given to Seller by Buyer.

9. Warranties - The Seller warrants that the articles to be supplied under this contract are fit and sufficient for the purpose intended; that they are merchantable, of good quality and free from defects, whether patent or latent, in material and workmanship; and that material or equipment for aircraft construction conforms to required specifications as outlined in paragraph 7.
   The Seller warrants that is has good title to the articles supplied and that they are free and clear from all liens and encumbrances. These warranties, together with their service warranties and guarantees shall run to Buyer, its successor, assigns and/or to persons to whom the materials or articles may be resold.

10. Inspection - All materials or articles ordered will be subject to final inspection and approval at the plant of Buyer. Any articles which do not comply with this order or which contain defective material or workmanship may be rejected by Buyer irrespective of payment therefor. The Buyer may hold any articles rejected for cause for the Seller's instructions, or he may return them to the Seller at Seller's expense.

11. Confidential - The Seller shall not disclose any information concerning the order to any third party except as herein specified without first obtaining the written consent of the Buyer.

12. Seller as Independent Contractor - In filling this Purchase Order, the Seller shall be considered as an Independent Contractor, and in no sense or case an agent of the Buyer.

13. Assignment - Neither party may assign this contract without first obtaining written consent of the other party; provided that consent is hereby given to such assignment to any corporation with which either party may merge or consolidate or which may succeed to its business.

14. Interpretation - This Purchase Order is to be governed by the laws of the state in which it is issued.

All warranties herein shall be construed as conditions as well as warranties

ABC Form RE-100
(9/24/91)

RECEIVING REPORT

Shipper _____ P.O. No.: _____

_____ Date: _____

_____

ITEM	QTY	CODE NO.	PART NO.	DESCRIPTION

By _____
RECEIVING INSPECTOR

	ABC Form ST-100 Page ___ of ____

SHOP TRAVELER

Fill in blanks that apply:

Part/Assy Dwg. No. Next Assy Dwg. No.

Part/Assy Serial No. _____ Affixed: (Insp stamp) _____

Qty in Batch No. Inspected Insp. stamp

Sampling Plan Used: _____

Final Assembly Operation _____

Airplane Serial Number: _____

Assembly Operation Complete Y ____ N ____ Insp stamp

If No, Open Items: _____

OK for next operation with open items? Y ____ N ____

If yes, Quality Assurance Signature: _____ Date: _____

Next Assembly Operation:

		Stamps	
Item No.	Work Operation	Shop	Insp
(continue as needed)			

ABC AIRPLANE COMPANY
OPERATING PROCEDURES MANUAL
ENGINEERING
OPM-2

November 1, 1991

OPERATING PROCEDURES MANUAL
ENGINEERING OPM-2

ABC AIRPLANE COMPANY
1350 Willow Road
Wichita, Kansas 12345-1234

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REVISION CONTROL

Revision Number	Change	FAA Approved (signature)	Date

SECTION 1

1.1 RESPONSIBILITIES. The Director if Engineering is responsible for maintaining a close working relationship with FAA Engineering to ensure that all design changes or new designs meet the provisions of FAR Part 23. To facilitate this goal, the ABC Airplane Company Engineering Department has two branches.

1.1.1 DESIGN ENGINEERING, with a Chief Engineer who is primarily responsible for developing new designs, product improvement changes, and processing major changes to the type design resulting from Materials Review Board (MRB) actions.

1.1.2 PRODUCTION ENGINEERING, with a Chief Engineer who is primarily responsible for evaluating production errors or workmanship discrepancies to determine corrective action. All production engineering actions will be recorded on Rejection Slips, ABC Form RJ-100. The corrective action may be developed and approved by a production engineer if it is minor. In the case of major discrepancies, the production engineer will forward the Rejection Slip to MRB for processing and disposition.

1.2 CLASSIFYING CHANGES TO THE TYPE DESIGN. The following definitions will be used by ABC engineering to determine whether a change to the type design, resulting from either corrective actions processed by production engineering or new data developed by design engineering, is major or minor:

1.2.1 The change will be considered MAJOR when it has an APPRECIABLE (SIGNIFICANT) EFFECT on the following characteristics:

1.2.1.1 Weight and balance;

1.2.1.2 Structural strength;

1.2.1.3 Reliability; and/or

1.2.1.4 Operational.

1.2.2 Changes that have LITTLE EFFECT or NO EFFECT on the characteristics specified under paragraph 1.2.1 will be considered MINOR changes.

1.2.3 In general, changes will also be considered MAJOR changes when any published data or procedures related to the characteristic, such as the airplane flight manual or placards, operating limitations, or weight and balance data, require revision as a result of the change; and/or the approval of the change would require tests (a) to re-establish compliance with the section(s) of FAR Part 23 applicable to the change; and/or (b) to determine that no hazardous or unreliable conditions have been introduced in the airplane as a result of the change.

SECTION 2

2.1 DATA CHANGE CONTROL

2.1.1 ENGINEERING ORDER (EO), ABC Form EE-100. The EO is the primary form used to document changes to the type design, and when approved is the authority to make changes to type design data. EOs involving major changes to the type design will be furnished, along with the affected drawings, to FAA Engineering for review and approval before being issued. As agreed between ABC and FAA Engineering, EOs involving minor changes, including MRB actions, will be accumulated and sent to FAA Engineering for review every 90 days. The entries on the form will indicate:

2.1.1.1 The ABC engineer originating the change;

2.1.1.2 A description of the change;

2.1.1.3 The reason for the change;

2.1.1.4 The type design drawings that are affected, by drawing number and revision, with those requiring changes separately identified; and,

2.1.1.5 The effectivity of the change, by airplane serial number.

2.1.2 ADVANCED CHANGE NOTICE (ACN), ABC Form EE-200. The ACN will be issued by engineering upon approval of an EO involving minor design changes, drawing corrections, airplane effectivity, or other changes that are not classed as major changes, and will be distributed to Planning, Quality Assurance, and Production Control. The ACN form will be attached by engineering personnel to the affected drawings in the master file and in the drawing file maintained for production use. Planning will use the form as the basis for updating as necessary any Shop Travelers that may be affected. A drawing with one or more ACNs attached will not be given a change letter following the drawing number. For reference purposes, the latest ACN number will follow the drawing number; for example, Dwg. No. 12345C, ACN4. The ACN form will include:

2.1.2.1 A description of the change, including a detailed, dimensioned sketch of any rework, or modification that is necessary to incorporate the change;

2.1.2.2 The effectivity of the change by airplane serial number;

2.1.2.3 The number and revision of the primary drawing affected and all other drawings that may also require changes;

2.1.2.4 The EO number and its approval date, with the signature(s) of the engineer(s) preparing the EO and the ACN; and

2.1.2.5 The sequential identification number and the ACN issue date.

2.1.3 CHANGE NOTICE (CN), ABC Form EE-201. A CN is used to document a physical change to a drawing, and is superimposed in reduced size near the title block of the drawing that has been changed. A CN must be issued by engineering when the change covered by an EO is a major change, or when no more the 5 ACNs have accumulated for any given drawing. The CN will list any ACNs that are outstanding and that have been incorporated in the drawing, and will give the changed drawing a sequential letter following the drawing number to indicate the change status.

2.1.4 DRAWING ISSUANCE AND CONTROL. The Engineering Department is responsible for maintaining the drawing issuance and control system, which includes the following elements:

2.1.4.1 A secure area for maintaining a production file of drawing, with appropriate limited access for shop personnel to check out drawings;

2.1.4.2 A card index control with a card for each drawing in the file indicating the date and number of any ACNs that may have been issued. (When ACNs are received from engineering, the file clerk is responsible for retrieving the affected drawings from the file and attaching the ACNs to the drawing(s).)

2.1.4.3 A check-out system maintained by the file clerk for filing check-out slips completed by shop personnel, to keep track of when and to whom drawings have been issued; and

2.1.4.4 A system of dated stickers attached by the file clerk to each drawing issued to the shop, indicating the date that the drawing must be RETURNED to the file. The sticker will be attached by the file clerk at the time of issue and will be valid for 20 days from the date of issue, at which time it must be returned for updating as necessary. If ACNs are outstanding, the file clerk will attach them to the drawing and re-issue the drawing with a new date sticker. If no ACNs are outstanding, the drawing will simply be re-issued with a new date sticker. If the drawing has been changed with a CN, the file clerk will return the obsolete drawing to engineering, and will issue to the shop the new drawing, again with a date sticker valid for 20 days.

2.2 MATERIAL REVIEW. The Materials Review Board (MRB) will consist of the Directors of Engineering, Quality Assurance, and Manufacturing, or their qualified appointees.

2.2.1 The MRB will review rejected parts and materials and make decisions as to their disposition. Final decisions of the MRB will be for one airplane only and will not be used as repetitive decisions and be applied to other parts or materials for review.

2.2.2 If a rejection become chronic, is of a major magnitude that could affect other related parts or materials, or is of a nature where the corrective action would result in a product improvement, the MRB will recommend to engineering that the type design data be changed accordingly.

2.2.3 The MRB is also responsible for:

2.2.3.1 Ensuring that the causes of nonconformances are determined promptly, and that appropriate corrective or remedial action is taken by the responsible Director.

2.2.3.2 Maintaining records of cases, trends, and individual cases it acted upon and prepare individual records for summaries of action taken.

2.2.3.3 Establish a follow-up system to ensure the timeliness and effectiveness of all corrective or remedial action.

2.2.4 Processing of MRB actions and Rejection Slips will be as follows:

2.2.4.1 After a review decision has been made by the MRB, it will be recorded on the Rejection Slip, signed and dated by the participating MRB members, and returned to the issuing department with the affected parts or materials. If the corrective action is rework or repair, the MRB will provide a detailed, dimensioned description of the work required.

2.2.4.2 A copy of each Rejection Slip processed by the MRB will be attached to the affected Shop Traveler for use by shop personnel when rework or repair is required and for the permanent airplane record. The engineering department is responsible for maintaining a file of all Rejection Slips, which will be made available to the FAA upon request.

2.2.4.3 Nonconforming parts or materials that cannot be reworked, repaired, or otherwise salvaged by approved modifications will be scrapped and destroyed, or in the case of supplier furnished parts will be returned to the supplier.

SECTION 3

3.1 PRODUCTION GROUND TEST

3.1.1 The Director of Engineering is responsible for the development of procedures and parameters for all ground tests, static and functional, required to verify that the system involved meets the approved type design requirements. Each required test will be documented in the form of a checklist, which, upon satisfactory completion, will become part of the permanent records for the airplane. Engineering will provide a copy of the checklist identified with a document number, with the effectivity by serial number of the airplanes to which it is applicable, and the drawing number(s) involved, to Manufacturing Planning.

3.1.2 Manufacturing Planning will incorporate the checklist requirements on the Shop Traveler that would be effective at the stage of production when the test is required. The checklist document will be attached to the Shop Traveler. (Reference also OPM-1, paragraph 4.1)

3.1.3 Production Control will ensure that the test is completed in accordance with the Shop Traveler, the engineering document, and applicable drawings, and that the shop performing the test stamps the applicable work item on the Shop Traveler. Production Inspection will witness each test and sign off satisfactory completion on the Shop Traveler. A test that is not witnessed by production inspection will be considered unacceptable, and must be re-run unless other compelling evidence of satisfactory completion is found acceptable to Production Inspection and so verified by Quality Assurance.

3.2 PRODUCTION FLIGHT TEST. The Director of Engineering is responsible for developing the flight test procedures, in close coordination with FAA Engineering, used for production flight testing of airplanes produced by the ABC Airplane Company. The procedures, together with a checkoff list, (reference FAR 2.143(a)(3)) cover all flight and operational parameters developed during the airplane type certification program. Any changes to the flight test procedures will be submitted by the ABC engineering department to FAA engineering for review and approval. Implementation of the procedures is the responsibility of the Director of Manufacturing, reference OPM-1, Manufacturing, Section 4.2.

SECTION 4

4.1 PROCESS SPECIFICATIONS. The Director of Engineering is responsible for developing specifications and procedures for processes used by the ABC Airplane Company that are not adequately covered by industry or military standards, whenever such special processes may become necessary for new airplane designs. The airplanes currently being produced by the ABC Airplane Company use only conventional construction techniques (welding, riveting, fabric installation, etc.) The appropriate industry specifications for these processes, and including non-destructive inspection, will be identified in the title block of the applicable type design drawings. Copies of the specifications will be obtained, controlled, and issued by ABC Engineering using the same procedures that apply to other data, reference Section 2, paragraph 2.1.4.

4.2 MATERIAL SPECIFICATIONS.

4.2.1 The Engineering Department is responsible for establishing the specifications for all materials used in ABC airplanes as determined during the original design and the type certification approval process. Any changes to these specifications will be approved, using the criteria specified in Section 1, paragraph 1.2.

4.2.2 ABC Engineering is also responsible for evaluating and approving materials used in the production process that may have an effect on the quality and conformity of the completed airplane, and developing procedures for their proper use. Such materials include cleaning solvents, lubricating grease and oil, detergents, etc., that if not properly used, or if the wrong type is used, would have a corrosive or other deleterious effect on the airplane structure or systems. A listing of the approved materials by brand name and product identification will be provided by Engineering to Quality Assurance, Production Control, and Purchasing. ABC Engineering will evaluate any substitutes as notified by Purchasing, reference OPM-1, Section 1, paragraph 1.1.2.

4.3 SUPPLIER QUALIFICATION. The ABC Engineering Department is responsible for evaluating all materials procured from suppliers that require chemical or physical analysis to verify that the material meets the type design specification. The findings of the analysis, whether satisfactory or rejected, will be forwarded to Quality Assurance for further investigation of the suppliers qualifications. When the suppliers product is found to meet the applicable specification, and the supplier has been approved by Quality Assurance, the material will be listed in accordance with paragraph 4.2.2.

SECTION 5

5.1 SERVICE DIFFICULTIES

5.1.1 SERVICE PUBLICATIONS. The Director of Engineering is responsible for the development of publications that advise ABC airplane operators of service problems that have been reported and that may affect other airplanes in the fleet, and of the corrective action for such problems. The Engineering Department will promptly investigate all reported failures, malfunctions, and defects and develop the appropriate corrective action. As determined by the magnitude of the service problem, the publication subsequently distributed to the operators will be:

5.1.1.1 AIRWORTHINESS DIRECTIVE (AD). An AD will be used when an unsafe condition is found to exist that may also exist in other airplanes in the fleet. The FAA processes and issues ADs, however, ABC Engineering is responsible for full cooperation with the FAA in providing design data for rework that may be required, in conducting static or flight tests to verify the adequacy of corrective action, and any other assistance that may be requested by the FAA, such as making available ABC engineering or quality assurance personnel to participate in accident scene investigation.

5.1.1.2 SERVICE BULLETINS. When no unsafe condition exists, but a service problem has become repetitive, ABC Engineering will develop a design change that will contribute to the safety of ABC airplanes, obtain FAA approval as required (reference Section 1, paragraph 1.2, and Section 2, paragraph 2.1.1), and issue a Service Bulletin containing information on the design change for distribution to all operators of ABC airplanes. Service Bulletins may also be issued for minor changes considered product improvements. All Service Bulletins issued by ABC Engineering, major or minor, are made available to FAA engineering for review.

5.1.1.3 SERVICE LETTERS. ABC Engineering will also issue Service Letters on any subject that is considered helpful to operators. Such letters are intended to maintain a good rapport with the operators, to encourage feedback on service or other problems, or to circulate items of interest that an operator may feel would be of value to all operators.

5.1.2 CUSTOMER SUPPORT. The Director of Engineering is responsible for establishing and maintaining the ABC Customer Support Department, which is the focal point for all communication involving customer services with operators of ABC airplanes. ABC Company does not prohibit direct communication with operators by either Engineering or Quality Assurance, however, such direct communication is held to a minimum, and copies are routed to Customer Support for information. Customer Support is responsible for:

5.1.2.1 Maintaining a current listing of ABC airplanes in service by serial number and FAA registration number, together with the name and address of the owner/operator.

5.1.2.2 Distributing Service Bulletins and Service Letters issued by ABC Engineering. Customer Support may also issue Service Letters with information that does not require engineering evaluation or action.

5.1.2.3. Forwarding to ABC Engineering or Quality Assurance, as applicable, any communications from operators that involve questions concerning design/operational problems or matters relating to the quality of the ABC airplanes or the quality of replacement parts provided by the ABC Company. Engineering and/or Quality Assurance will investigate the matter, and provide the information to Customer Support who will respond to the operator.

5.2 FAR 21.3 REPORTING. The Director of Engineering is responsible for reporting to the Aircraft Certification Office any occurrences listed under FAR 21.3(c) that become known to the ABC Airplane Company through any source. Such reports will be made within 24 hours after verification by Engineering that the failure, malfunction, or defect has occurred, and in accordance with FAR 21.3(e). It is the policy of the ABC Airplane Company to report under FAR 21.3 for the record, even when the failure, malfunction, or defect has previously been reported by others under FAR 21.3(d).

SECTION 6

6.0 FORMS. This section shows examples of forms used by the ABC Company Engineering Department.

ABC Form RJ-100

REJECTION SLIP

Date: Time: Part No.:

Airplane Serial No.: Assembly Serial No.:

Description of Defect:

Found by (Name & Department): _____

Evaluated by (Engineer): _____
date

Materials Review Required? (Yes or No) _____

Final Disposition: Use as is ____ Repair ____ Replace ____ Reject ____

Approved by (Name & Department): _____

Description of Corrective Action: (Include detailed/dimensioned sketch if necessary)

Drawn By: _____ Date: _____

Approved By: _____ Date: _____

Recommended for drawing change? (Yes or No) _____

Recommended for system corrective action to preclude recurrence? (Yes or No) _____

	ABC Form FT-100 (9/24/91)

FLIGHT TEST CHECK-OFF LIST

Procedure & Check List

Reg. No. _____ Serial No. _____ Model No. _____ Date _____

BEFORE TAKE-OFF	**CHECKS OK**
1. Check engine controls	
2. Check idle speed carb heat cold	
3. Oil pressure	
4. Oil temperature	
5. Fuel pressure	
6. Ammeter	
7. Static max. RPM with mixture position at best power setting _____	
8. Mag. Drop _____ Left _____ Right _____ @ 1700 RPM	
9. Carb. heat RPM drop from 1700 RPM setting with mixture rich _____	
10. Check control travel & direction	
11. Brake check	
12. Radio check	
DURING FLIGHT	
1. Full throttle RPM at best rate of climb IAS 75 mph RPM _____	
2. Cruising RPM 2350 altitude _____ OAT _____ IAS _____ balance oil temp _____ oil pressure _____ fuel pressure (engine _____ electric) _____	
3. Top level flight IAS _____ RPM _____ Altitude _____	
4. Stall power on _____ IAS Power off _____ IAS Altitude _____	
5. Dive VG (135) RPM _____	
6. Power off glide - nose up trim _____ IAS @ _____ RPM	
7. Check stall warning _____ IAS	
8. Check flap operation in flight	
9. Ammeter (after 1-1/2 hrs. flight)	
10. Cabin heater operation	
11. CO test	

ABC AIRPLANE COMPANY
OPERATING PROCEDURES MANUAL
QUALITY ASSURANCE
OPM-3

November 1, 1991

OPERATING PROCEDURES MANUAL
QUALITY ASSURANCE OPM-3

ABC AIRPLANE COMPANY
1350 Willow Road
Wichita, Kansas 12345-1234

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REVISION CONTROL

Revision Number	Change	FAA Approved (signature)	Date

SECTION 1

1.1 PRODUCTION INSPECTION. The Director of Quality Assurance is responsible for ensuring that the production inspection functions of the Manufacturing Department are carried out in a manner that will result in a complete airplane that conforms to the type design and is in condition for safe operation when presented to the FAA for Airworthiness Certification. These responsibilities include:

1.1.1 Reviewing the work background and experience of manufacturing personnel who have been selected to perform inspection functions, to determine whether they are qualified to be inspectors.

1.1.2 Providing training in ABC Company policy related to maintaining airplane quality, and to familiarize selected individuals with the FAA procedures and regulations that apply to holders of FAA Production Certificates.

1.1.3 Issuing Inspection Stamps to qualified and trained individuals, and establishing and maintaining a system to control the issuance of stamps and keeping performance records for each individual to whom the stamps were issued. For a new inspector the stamps will be valid for 3 months, subject to renewal for 6 months if the inspectors performance is satisfactory. After 6 months of satisfactory performance, the stamp may be renewed for a maximum of 1 year.

1.1.4 Resolving differences of opinion between shop personnel and inspectors concerning an inspectors judgment in rejecting parts or components because of workmanship or nonconformities. If the issue cannot be resolved by reference to type design data, the matter will be referred to the Materials Review Board, reference OPM-1, paragraph 3.1.3.

1.1.5 Reviewing type design data in conjunction with the FAA and ABC Manufacturing Planning to identify airplane areas, components, or systems with critical characteristics that require closure or other special inspection, reference OPM-1, paragraph 2.2.2.4.

1.1.6 Maintaining and using any records or data essential to the effective operation of the quality assurance program. These records will be available for review by the FAA and copies of individual records will be furnished to the FAA upon request. The quality assurance program will ensure that the records are complete and reliable, and that their analysis may be used as a basis for management action.

1.2 INSPECTION STATIONS. The Quality Assurance Department works in conjunction with the Manufacturing Department in establishing Inspection Stations located in major fabrication and assembly areas within easy access to inspection and production personnel. Maintaining the Production Control data and records at these

stations is the responsibility of Manufacturing. Quality Assurance is responsible for ensuring that data relating to inspection functions is complete and kept current.

1.3 INSPECTION RECORDS. The Quality Assurance Department is responsible for collection of all manufacturing, inspection, and engineering data and records for each completed airplane. These data include completed Shop Travelers, together with any attachments such as Rejection Slips, engineering data involving major changes that may apply to the individual airplane, ground and flight test checkoff lists, and any other data that pertains to the quality and conformity of that airplane. Quality Assurance is the custodian of all completed record packages, which will be retained by ABC for at least 2 years.

1.4 MATERIALS REVIEW.

1.4.1 The Director of Quality Assurance or his appointee will participate in all Materials Review Board actions. The objective of Quality Assurance participation is to ensure that quality of workmanship and conformity to approved type design data is maintained in resolving discrepancies that have been submitted to the MRB for disposition, (reference OPM-1, paragraph 2.4).

1.4.2 Quality Assurance is also responsible for monthly or random audits of Materials Review segregation areas and bins for items awaiting materials review action in shop areas to ensure that security is being maintained, and that nonconforming items are not finding their way back into production areas, (reference OPM-1, paragraph 2.4).

SECTION 2

2.1 QUALITY ASSURANCE AUDITS

2.1.1 A major function of the Quality Assurance Department is to maintain a system and schedule of annual audits of all ABC Airplane Company facilities and activities, including selected suppliers, to ensure that the Quality Assurance data and procedures approved for the ABC Production Certificate are being adhered to. These audits will cover the following, in addition to any special audits deemed necessary by Quality Assurance in individual cases:

2.1.1.1 Fabrication and assembly areas;

2.1.1.2 Receiving and storage;

2.1.1.3 Processes and controls;

2.1.1.4 Measure and Test Equipment Control; and

2.1.1.5 Selected suppliers, generally of critical items.

2.2 AUDIT FOLLOW-UP ACTION. The audit findings will be recorded on Correction Sheets, ABC Form QA-100, and routed to the appropriate department for corrective action, which must be accomplished within 5 working days by the department receiving the form. The Correction Sheet will then be stamped by production and returned to Quality Assurance, who will verify that the item has been resolved. In the case of suppliers, the audit findings will be transmitted by letter to the supplier.

2.3 FAA ACSEP AUDITS (Aircraft Certification Systems Evaluation Program).

2.3.1 The Quality Assurance Department is the focal point for the ABC Company and the FAA in all matters related to scheduled ACSEP audits. As required by the FAA audit team, Quality Assurance will provide a room, desks, and copies of all ABC technical data, including the Quality Assurance Manual, the Operating Procedures Manuals, Process Specifications, and Operating Inspections that have been issued by ABC departments, as well as any other material or data requested by the FAA.

2.3.1 The Quality Assurance Department is also responsible for ensuring that prompt corrective action is taken by the applicable department on any discrepancies found by the FAA ACSEP team, and reporting such completed actions to the FAA.

SECTION 3

3.1 DELEGATION OF AUTHORITY TO SUPPLIERS.

3.1.1 The Director of Quality Assurance is responsible for developing a listing of all suppliers used by the ABC Company, together with information regarding delegation of authority to such suppliers. The suppliers will be audited by Quality Assurance for competency before being approved by ABC, and the audit findings will serve to determine the extent and type of delegation that may be granted. Such delegations include:

3.1.1.1 Major inspections of parts or assemblies that cannot be completely inspected by ABC Receiving Inspection upon receipt.

3.1.1.2 Materials Review actions at the supplier facilities. When this function has been delegated, ABC Engineering and Quality Assurance are responsible for reviewing each such action after the fact to ensure that the dispositions are in accordance with ABC policy and procedures. If the function is not delegated, each MRB action by the supplier must be reviewed by ABC Engineering and Quality Assurance, and approved before the action is implemented.

3.1.1.3 Direct shipment of a domestic supplier's product to ABC airplane operators. This authority is delegated ONLY when the supplier is one of high integrity in the industry, has demonstrated over at least 2 years that the parts/materials furnished are consistently in conformity with the Purchase Order specifications. The Director of Quality Assurance may authorize direct shipment by a domestic supplier found qualified, but only with the concurrence of the Directors of Manufacturing and Engineering. (Reference OPM-1, Paragraph 1.1.5)

3.2.1 The Director of Quality Assurance is also responsible for scheduling recurrent audits of suppliers at least once a year, or at any time if questions should arise concerning the quality of products furnished by the supplier.

SECTION 4

4.1 AIRWORTHINESS CERTIFICATION.

4.1.1 Upon completion of each airplane by its department, the Directors of Manufacturing and Engineering will advise the Director of Quality Assurance that the airplane is shop complete, no Shop Travelers are outstanding, the airplane has been satisfactorily production flight tested, that the flight manual, placards, operating limitations, and all changes applicable to the airplane, major and minor, have been appropriately FAA approved, and that any applicable Airworthiness Directives have been incorporated.

4.1.2 The Quality Assurance Department is responsible for preparing the Application for Airworthiness, FAA Form 8130-6, when the notifications of completion have been received from Manufacturing and Engineering. The Director of Quality Assurance is the only person in the ABC Company authorized by the President to sign the “Owner’s Certification”, Block III.D. on the Application for Airworthiness, prior to its submittal to the FAA.

4.1.3 In the case of completed airplanes destined for foreign operators, Quality Assurance is responsible for ensuring that Items 6 thru 9 on the Application for Export Certificate of Airworthiness, FAA Form 8130-1, have been properly accomplished. The Director of Quality Assurance is also the only person authorized to sign the “Exporter’s Certification”, Item 11, on the application form.

SECTION 5

5.0 FORMS. This section shows examples of forms used by the ABC Company Quality Assurance Department

	ABC Form QA-100 Page____ of ____
CORRECTION SHEET	
Kind of Audit: _____	Date(s): _____
Conducted By: _____	Department: _____
Shop/Department Audited: _____	
Shop/Department Notified (Date & Stamp): _____	
FINDINGS (First stamp blocks indicate findings. Second stamp blocks indicate that corrective action has been completed.)	
Item No. Discrepancy	Stamps Insp. Date
	_____
	_____
(continue as needed)	